REMARKS

This Amendment is responsive to the Office Action mailed December 12, 2001 in which claims 1-20 were rejected. With this Response, claims 9 has been canceled and claims 1-5, 7, 10-12, 15, 16 and 20 have been amended. Claims 1-8 and 10-20 remain pending in the application and are presented for reconsideration and allowance.

Specification Objections

The specification was objected to due to various informalities. In particular, reference numeral "92" on page 7, lines 23 and 24 should be changed to --90--; reference numeral "72" on page 10, line 15 should be changed to --12--; and reference numeral "98" on page 12, line 8 should be changed to --100--. In response, applicants have rectified these informalities. In addition, applicants have rectified other inadvertent errors on pages 1, 4, 7 and 9-15. Applicants respectfully request consideration and approval of all the changes to the specification. In light of these changes, applicants believe that the objections to the specification have been overcome and should be withdrawn. Such action is respectfully requested.

Drawings

In order to rectify an inadvertent error, included herewith is a copy of one (1) sheet of drawings with a proposed drawing change to Figure 10b. In figure 10b, reference numeral "38" has been changed to --36--. This change is shown in red. Applicants request consideration and approval of this proposed drawing change. Upon Examiners' approval of this proposed drawing change, Applicants will submit substitute formal drawings with the proposed change incorporated therein. Applicants have also included a separate letter to the Official Patent Draftsperson requesting approval of this proposed drawing change.

Claim Rejections under 35 U.S.C. § 112

Claim 9 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the term "suspension" was said to lack antecedent

basis. Claim 9 has been canceled thereby obviating the rejection based upon 35 U.S.C. § 112, second paragraph.

Claim Rejections under 35 U.S.C. § 102

Claims 1, 2, 5-11 and 14-20 were rejected under 35 U.S.C. § 102(b) as being anticipated by the U.S. Patent 6,039,441 to Tomikawa et al. Tomikawa et al. in figures 1a, 1b and 5b is said to disclose a replaceable ink container for providing ink to an inkjet printing system, and a method of forming a seal. The inkjet printing system is said to include a printhead 21 and a receiving station 27 for receiving the replaceable ink container. The receiving station is said to have a fluid inlet 24 and a sealing structure 22. The replaceable ink container is said to comprise a reservoir 2 having a fluid outlet 11 and a sealing surface 14 proximate thereto. A sealing material (ink) is said to be contained within the reservoir for wetting the sealing surface to seal defects between the sealing surface and the sealing structure. Specific reference was made to column 5, lines 59-60 of Tomikawa et al. The sealing material containing pigmented particles is said to be an inherent feature of ink. Moreover, the solidifying of the solid pigmented particles out of suspension to create a seal is said to be an ink meniscus effect that is an inherent feature of ink.

In response, claim 1 has been amended and is now directed to a replaceable ink container for providing ink to an inkjet printing system having a receiving station for receiving the replaceable ink container. The receiving station having a fluid inlet and a sealing structure. The replaceable ink container comprising a reservoir defining a fluid outlet with a sealing surface proximate the fluid outlet, and a sealing material contained within the reservoir for wetting the sealing surface. The sealing material including solid particles held in a suspension, such that solidification of the solid particles acts to seal defects between the sealing surface and the sealing structure.

Using a sealing material that contains solid particles that come out of a suspension and solidify creates an improved seal between a sealing surface of the replaceable ink container and a sealing structure of the receiving station. This improved seal seals defects at the sealing surface and thereby prevents the loss of volatiles from ink within the ink container and minimizes the transfer of air into the ink delivery system resulting in improved printing

system reliability and an improvement in the quality of printed images. A replaceable ink container having a seal of this type is simply not taught, disclosed or anticipated by Tomikawa et al.

Tomikawa et al. in figures 1A, 1B, 2A and 2B is directed to a replaceable ink tank 1 insertable into a holding member 27 of a printing system. The holding member includes a recording head 21 and an elastic jointing member 22. The ink tank 1 includes an ink chamber 2 having a joint port 12 which is connectable to the elastic jointing member 22 to deliver ink from the ink chamber 2 to the recording head 21. The elastic jointing member 22 includes an umbrella shaped portion that engages a depressed part 14 of the ink tank to form a hermetic seal therebetween.

It is clear from a complete review of Tomikawa et al., the Tomikawa et al. does not disclose what is now claimed in amended independent claim 1. In particular, Tomikawa et al. does not disclose a replaceable ink container comprising a reservoir defining a fluid outlet with a sealing surface proximate the fluid outlet, and **a sealing material contained within the reservoir for wetting the sealing surface, with the sealing material including solid particles held in a suspension, such that solidification of the solid particles acts to seal defects between a sealing surface of the ink container and a sealing structure of a receiving station**. In Tomikawa et al. there is no support whatsoever for a sealing material within an ink container wetting the area between a sealing surface of the ink container and a sealing structure of a receiving station. Column 5, lines 59-60 of Tomikawa et al. referred to by the Examiner merely states that "when the ink tank 1 is detached from the recording head 21, a small amount of ink sticks to the depressed part 14, and no ink drips from the ink tank 1". This language clearly does not anticipate the wetting of the area between a sealing surface of the ink container and a sealing structure of a receiving station, as set forth in amended independent claim 1, since ink can adhere to portions of the depressed part 14 not contacted by the elastic jointing member 22. Moreover, there is no support in Tomikawa et al. for the **sealing material including solid particles held in a suspension, such that solidification of the solid particles acts to seal defects between a sealing surface of the ink container and a sealing structure of a receiving station**, as now set forth in amended independent claim 1. Quite simply, Tomikawa et al. never discusses the composition of the

ink in the ink tank 1. In addition, Examiner's position that sealing material containing solid particles is an inherent feature of ink is simply not correct. Dye based inks do not have particles held in suspension. The ink of Tomikawa et al. could be a dye based ink. Moreover, Examiner's position that the solidifying of the solid pigmented particles out of suspension to create a seal is an inherent feature of ink is also not correct. Once again, dye based inks do not have particles held in suspension. The ink of Tomikawa et al. could be a dye based ink.

Using a sealing material that contains solid particles that come out of a suspension and solidify creates an improved seal between a sealing surface of the replaceable ink container and a sealing structure of the receiving station. This improved seal seals defects at the sealing surface and thereby prevents the loss of volatiles from ink within the ink container and minimizes the transfer of air into the ink delivery system resulting in improved printing system reliability and an improvement in the quality of printed images.

For the reasons set forth above, Applicants believe that Tomikawa et al. does not disclose, teach, or anticipate, either implicitly or explicitly, what is now claimed by Applicants in amended independent claim 1. Hence, Applicants believe that the rejection of independent claim 1 under 35 U.S.C. § 102(b) has been overcome and should be withdrawn. Such action is respectfully requested.

Independent claims 7, 10 and 16 have been amended to include language similar to that added to amended independent claim 1. As such, the remarks above directed to amended independent claim 1 are equally applicable to amended independent claims 7, 10 and 16. Therefore, for the reasons set forth above, Applicants believe that Tomikawa et al. does not disclose, teach, or anticipate, either implicitly or explicitly, what is now claimed by Applicants in amended independent claims 7, 10 and 16. Hence, Applicants believe that the rejection of independent claims 7, 10 and 16 under 35 U.S.C. § 102(b) has been overcome and should be withdrawn. Such action is respectfully requested.

Dependent claims 2-6, 8, 11-15 and 17-20 are directly or indirectly dependent upon amended independent claims 1, 7, 10 and 16. As discussed above, it is believed that amended independent claims 1, 7, 10 and 16 are now in a condition for allowance. Therefore, consideration and allowance of dependent claims 2-6, 8, 11-15 and 17-20 is also requested.

Claim Rejections under 35 U.S.C. § 103

Claims 3, 4, 12 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomikawa et al. in view of the U.S. Patent 5,085,698 to Ma et al. Tomikawa et al. is said to disclose the invention as claimed except for the sealing material containing black particles, and a dispersant. Nevertheless, Ma et al. is said to disclose ink containing carbon black particles for the purpose of providing black pigments, and a dispersant for the purpose of dispersing the pigment particles. Specific reference was made to column 8, lines 38-39, and column 9, lines 29-30 and 40-41 of Ma et al. Therefore, the position was taken that it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Tomikawa et al. with ink containing carbon black particles and a dispersant as taught by Ma et al. for the purpose of providing black pigments and dispersing the pigmented particles.

In response, as stated above, claims 3, 4, 12 and 13 are dependent upon believed to be allowable independent claims 1 and 10, and therefore are believed to be allowable therewith.

CONCLUSION

In conclusion, it is believed that all claims 1-8 and 10-20 of this application are now in condition for allowance. A notice to that effect is respectfully requested.

Attached hereto is a marked-up version of the changes made to the specification and/or the claims by the current Amendment. The attached pages are captioned **"VERSION WITH MARKINGS TO SHOW CHANGES MADE".**

Any inquiry regarding this Amendment and Response should be directed to Kevin B. Sullivan at Telephone No. (858) 655-5228, Facsimile No. (858) 655-5859. In addition, all correspondence should continue to be directed to the following address:

Hewlett-Packard Company
Intellectual Property Administration
P.O. Box 272400
3404 E. Harmony Road, M/S 35
Fort Collins, Colorado 80527-2400

Respectfully submitted,

Mark A. Smith et al.,

By their attorneys,

DICKE, BILLIG & CZAJA, P.A.
701 Building, Suite 1250
701 Fourth Avenue South
Minneapolis, MN 55415
Telephone: (612) 573-2009
Facsimile: (612) 573-2005

Date: 3-12-02
TAR:cmj

Thomas A. Rendos
Reg. No. 33,349

CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this paper or papers, as described herein, are being deposited in the United States Postal Service, as first class mail, in an envelope address to: Commissioner for Patents, Washington, D.C., 20231 on this 12th day of March, 2002.

By
Name: Thomas A. Rendos

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Mark A. Smith et al. Examiner: Michael P. Nghiem

Serial No.: 09/839,385 Group Art Unit: 2861

Filed: April 20, 2001 Docket No.: 10001074-1

Title: INK CONTAINER CONFIGURED TO ESTABLISH RELIABLE FLUIDIC CONNECTION TO A RECEIVING STATION

VERSION WITH MARKINGS TO SHOW CHANGES MADE

AMENDMENT AND RESPONSE

Commissioner for Patents
Washington, D.C. 20231

Dear Sir/Madam:

This Amendment is responsive to the Office Action mailed December 12, 2001. Please amend the above-identified patent application as follows:

IN THE SPECIFICATION

Please replace the paragraph beginning at page 1, line 14, with the following rewritten paragraph:

The present invention relates to ink containers for providing ink to inkjet printers. Inkjet printers frequently make use of an inkjet printhead mounted on a carriage that is moved back and forth across print media, such as paper. As the printhead is moved across the print media, a control system activates the printhead to deposit or eject ink droplets onto the print media to form images and text. Ink is provided to the printhead by a supply of ink that is either carried by the carriage or mounted to the printing system so as not to move with the carriage.

Please replace the paragraph beginning at page 4, line 16, with the following rewritten paragraph:

In an illustrative embodiment, the replaceable ink container 12, the receiving station 14, and the ink jet printhead 16 are each part of a scanning print carriage 20 that is moved relative to a print media 22 to accomplish printing. Alternatively, the ink jet printhead 16 is fixed and the print media is moved past the printhead 16 to accomplish printing. The printer portion 18 includes a media tray 24 for receiving print media 22. As print media 22 is stepped through the print zone, the scanning carriage moves the printhead 16 relative to the

print media 22. The printer portion 18 selectively activates the printhead 16 to deposit ink on print media 22 to thereby accomplish printing.

Please replace the paragraph beginning at page 7, line 6, with the following rewritten paragraph:

The scanning carriage portion 20 shown in FIG. 3 is shown fluidically coupled to a single printhead 16 for simplicity. Each of the replaceable ink containers 12 includes a latch 30 for securing the replaceable ink container 12 to the receiving station 14. The receiving station 14 in the preferred embodiment includes a set of keys 32 that interact with corresponding keying features 84 on the trailing end 82 of ~~(not shown) on~~ the replaceable ink container 12 (see FIG. 6). The keying features 10 on the replaceable ink container 12 interact with the keys 32 on the receiving station 14 to ensure that the replaceable ink container 12 is compatible with the receiving station 14.

Please replace the paragraph beginning at page 7, line 23, with the following rewritten paragraph:

In the preferred embodiment, the reservoir 34 has a capillary storage member ~~92~~ 90 (FIGS. 8-9) disposed therein. The capillary storage member ~~92~~ 90 is a porous member having sufficient capillarity to retain ink to prevent ink leakage from the reservoir 34 during insertion and removal of the ink container 12 from the printing system 10. This capillary force is sufficiently great to prevent ink leakage from the ink reservoir 34 over a wide variety of environmental conditions such as temperature and pressure changes. In addition, the capillary of the capillary member is sufficient to retain ink within the ink reservoir 34 for all orientations of the ink reservoir as well as a reasonable amount of shock and vibration the ink container may experience during normal handling. The preferred capillary storage member is a network of heat bonded polymer fibers described in US Patent Application entitle "Ink Reservoir for an Inkjet Printer" attorney docket 10991407 filed on October 29, 1999, serial number 09/430,400, assigned to the assignee of the present invention and incorporated herein by reference. Other types of capillary material could alternatively be employed, such as foam.

Please replace the paragraph beginning at page 9, line 15, with the following rewritten paragraph:

FIG. 5 is a front perspective view of the ~~ink~~ receiving station 14 shown in isolation. The receiving station 14 shown in FIG. 5 includes a monochrome bay 56 for receiving an ink container 12 containing a single ink color and a tri-color bay 58 for receiving an ink container having three separate ink colors contained therein. In this preferred embodiment, the monochrome bay 56 receives a replaceable ink container 12 containing black ink, and the tri-color bay receives a replaceable ink container 12 containing cyan, magenta, and yellow inks, each partitioned into a separate reservoir within the ink container 12. The receiving station 14 as well as the replaceable ink container 12 can have other arrangements of bays 56 and 58 for receiving ink containers containing different numbers of distinct inks contained therein. In addition, the number of receiving bays 56 and 58 for the receiving station 14 can be fewer or greater than two. For example, a receiving station 14 can have four separate bays for receiving four separate monochrome ink containers 12 with each ink container containing a separate ink color to accomplish four-color printing.

Please replace the paragraph beginning at page 9, line 28, with the following rewritten paragraph:

Each bay 56 and 58 of the receiving station 14 includes an aperture 60 in the bottom wall 68 for receiving each of the upright fluid interconnects 36 that extend there through. The fluid interconnect 36 is a fluid inlet for ink to exit a corresponding fluid outlet associated with the ink container 12. An electrical interconnect 62 is also included on the back wall 66 in each receiving bay 56 and 58. The electrical interconnect 62 includes a plurality of electrical contacts 64. In the preferred embodiment, the electrical contacts 64 are an arrangement of four spring-loaded electrical contacts that engage a plurality of electrical contacts 78 of the ink container 12 with proper installation of the replaceable ink container 12 into the corresponding bay of the receiving station 14.

Please replace the paragraph beginning at page 10, line 10, with the following rewritten paragraph:

FIG. 6 is a bottom view of a three-color replaceable ink container 12 of the present invention shown in isolation. The replaceable ink container includes a pair of outwardly projecting guide rail engagement features 40. In the preferred embodiment, each of these guide rail engagement features 40 extend outwardly in a direction orthogonal to upright side 70 of the replaceable ink container 12. The engagement feature 42 extend outwardly from a front surface or leading edge 72 of the ink container ~~72~~ 12. The engagement features 42 are disposed on either side of an electrical interface 74 and are disposed toward a bottom surface 76 of the replaceable ink container 12. The electrical interface 74, shown in Fig. 7, includes ~~a~~ the plurality of electrical contacts 78, with each of the electrical contacts 78 electrically connected to an electrical storage device 80.

Please replace the paragraph beginning at page 10, line 20, with the following rewritten paragraph:

Once the ink container 12 is installed into the printing system 10 and fluidically coupled to the printhead by way of fluid interconnect 36, the capillary storage member ~~92~~ 90 should allow ink to flow from the ink container 12 to the ink jet printhead 16. As the printhead 16 ejects ink, a negative gauge pressure, sometimes referred to as a backpressure, is created in the printhead 16. This negative gauge pressure within the printhead 16 should be sufficient to overcome the capillary force retaining ink within the capillary member ~~92~~ 90, thereby allowing ink to flow form the ink container 12 into the printhead 16 until equilibrium is reached. Once equilibrium is reached and the gauge pressure within the printhead 16 is equal to the capillary force retaining ink within the ink container 12, ink no longer flows from the ink container to the printhead 16. The gauge pressure in the printhead 16 will generally depend on the rate of ink ejection from the printhead 16. As the printing rate or ink ejection rate increases, the gauge pressure within the printhead will become more negative, causing ink to flow at a higher rate to the printhead 16 from the ink container 12.

Please replace the paragraph beginning at page 11, line 16, with the following rewritten paragraph:

FIG. 7 is a perspective view of a monochrome or single color replaceable ink container 12 of the present invention. The monochrome ink container 12 is similar to the tri-color ink container 12 shown in FIG. 6 except that only a single ink color is ~~container~~ contained therein instead of three separate ink colors contained with the tri-color ink container 12.

Please replace the paragraph beginning at page 11, line 20, with the following rewritten paragraph:

FIG. 8 is a cross-sectional view taken along line 8-8 of ~~FIG. 4~~ FIG. 3, illustrating in further detail the ink container 12, comprising the reservoir portion or containment vessel 34, with the reservoir material 90 disposed therein. The ink container 12 is shown positioned for connection with the fluid interconnect 36 on the ink container receiving station 14 for illustrative purposes.

Please replace the paragraph beginning at page 12, line 1, with the following rewritten paragraph:

The ink container receiving station 14 also includes a sealing structure 96 to provide a seal between the ink container 12 and the receiving station 14. The sealing structure 96 tends to limit evaporation of volatile ink components such as water within the ink container 12 once the ink container 12 is properly installed into the receiving station 14. In addition, the sealing structure 96 tends to prevent contamination of the ink provided to the printhead ~~14~~ 16. In one preferred embedment, the sealing structure 96 is a circumferential structure that is formed from a resilient material. As the ink container 12 is inserted into the receiving station 14, the sealing structure 96 engages a sealing surface ~~98~~ 100 proximate the fluid outlet 88 of the ink container to form a seal between the sealing structure 96 and the ink container 12. The seal is established by a sealing surface 98 associated with the sealing structure 96 engaging the sealing surface 100 associated with the ink container 12.

Please replace the paragraph beginning at page 13, line 3, with the following rewritten paragraph:

The sealing structure 96 in one exemplary embodiment is formed of a resilient material such as elastomeric structure such as Ethylene-Propylene-Diene monomer/butyl blend (EPDM/buytyl). Alternatively, the sealing structure 96 includes a spring that is compressed as the ink container 12 is inserted into the receiving station 14 so that the spring urges the sealing structure 96 against the ink container 12 to establish a seal between the ink container 12 and the receiving station 14 to prevent evaporation of volatiles within the ink. An exemplary form of the sealing structure 96 with a spring is described in co-pending application serial number 09/651,682, filed August 30, 2000, LONG-LIFE SPRING-BACKED FLUID INTERCONNECT SEAL.

Please replace the paragraph beginning at page 13, line 28, with the following rewritten paragraph:

FIG. 10b is a cross-section taken across lines 10 b to show the sealing surface 98 of the sealing structure 96 shown partially broken away. In one preferred embodiment, the annular groove 102 is formed within the sealing surface 98 to retain the sealing material 104. Retaining sealing material 104 within the groove 102 ensures sealing material 104 is present to seal defects that exist along the entire continuum of the seal surface. Defects along the seal surface may be the result of molding defects that can produce irregularities in the seal surface, or contamination on the seal surface. Be sealing defects with the sealing material 104 the seal between the sealing surface 98 and the sealing surface 100 is improved.

Please replace the paragraph beginning at page 14, line 27, with the following rewritten paragraph:

The present invention has been discussed with respect to the use of sealing material to improve the robustness of the seal between the ink container 12 and the receiving station 14. The technique of the present invention is suitable for sealing other fluid seals in the ink delivery system as well. For example, a similar seal arrangement can be used between the printhead 16 and the fluid interconnect ~~36~~ 92 as the seal arrangement used between the ink

container 12 and the fluid interconnect 36. The sealing material of the present invention can be used to seal defects present in the seal between the printhead 16 and the fluid interconnect ~~36~~ 92.

IN THE CLAIMS

Please cancel claim 9.

Please amend claims 1-5, 7, 10-12, 15, 16 and 20 as follows:

1. (Amended) A replaceable ink container for providing ink to an inkjet printing system, the inkjet printing system having a receiving station for receiving the replaceable ink container, the receiving station having a fluid inlet and a sealing structure, the replaceable ink container comprising:

a reservoir defining a fluid outlet and a sealing surface proximate the fluid outlet; and

a sealing material contained within the reservoir for wetting the sealing surface, the sealing material including solid particles held in a suspension, solidification of the solid particles acting to seal defects between the sealing surface and the sealing structure.

2. (Amended) The replaceable ink container of claim 1 wherein the solid particles are ~~sealing material contains~~ pigment particles.

3. (Amended) The replaceable ink container of claim 1 wherein the solid particles are ~~sealing material contains~~ carbon black particles.

4. (Amended) The replaceable ink container of claim 1 wherein the suspension is ~~further including~~ a dispersant.

5. (Amended) The replaceable ink container of claim 1 wherein the sealing material contained within the reservoir ~~contains~~ is a quantity of ink.

6. The replaceable ink container of claim 1 wherein the sealing surface is configured to be sufficiently wettable such that the sealing surface is wet by the sealing material.

7. (Amended) A method for forming a seal between a replaceable ink container and a sealing structure, the method comprising:

wetting a sealing surface on the replaceable ink container with a sealing material defined by solid particles held in a suspension which is contained within the replaceable ink container; ~~and~~

engaging the sealing surface with a sealing structure whereby the sealing material is disposed there between; and

solidifying the sealing material so that the solid particles fall out of the suspension and seal ~~for sealing~~ defects between the sealing surface and the sealing structure.

8. The method of claim 7 wherein the sealing material is an ink contained within the replaceable ink container.

9. (Cancelled)

10. (Amended) A replaceable ink container for providing ink to an inkjet printing system, the inkjet printing system having a receiving station for receiving the replaceable ink container, the receiving station having a fluid inlet and a sealing structure, the replaceable ink container comprising:

a storage reservoir having a capillary storage material disposed therein for retaining ink, the storage reservoir defining a fluid outlet and a sealing surface proximate the fluid outlet; and

an ink retained within the capillary storage material, the ink having particles suspended therein, the ~~ink for~~ particles solidifying on the sealing surface to seal defects between the sealing surface and the sealing structure.

11. (Amended) The replaceable ink container of claim 10 wherein the particles are ~~ink contains~~ pigment particles ~~suspended therein~~.

12. (Amended) The replaceable ink container of claim 10 wherein the particles are ~~ink contains~~ carbon black particles.

13. The replaceable ink container of claim 10 wherein the ink further includes a dispersant.

14. The replaceable ink container of claim 10 wherein the sealing surface proximate the fluid outlet is configured to be wetted by the ink stored within the ink container.

15. (Amended) The replaceable ink container of claim 10 wherein the sealing surface is configured for enhanced wettability such that the sealing surface is wet by the ~~sealing material~~ ink.

16. (Amended) A replaceable printing component for an inkjet printing system configured for receiving the replaceable printing component, the inkjet printing system having a fluid inlet and a sealing structure, the replaceable printing component comprising:

a sealing surface configured for engaging a corresponding sealing structure on the inkjet printing system; and

wherein the sealing surface is configured so that sealing material, defined by solid particles held in a suspension, ~~that~~ wets the sealing surface so that solidification of the solid particles seals defects between the sealing surface and the corresponding sealing structure.

17. The replaceable printing component of claim 16 wherein the replaceable printing component is a replaceable ink container.

18. The replaceable printing component of claim 16 wherein the replaceable printing component is a replaceable printhead.

19. The replaceable printing component of claim 16 wherein sealing material is pigmented ink.

20. (Amended) The replaceable printing component of claim 16 wherein the sealing surface engages the corresponding sealing structure on the inkjet printing system to form a face seal.